REMARKS

Currently claims 1-37 are pending. Claims 2-7, 15-18, 21-33 and 35-37 are indicated as being allowed. Claims 10, 19-20 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim. Applicant thanks Examiner Williams for her courtesy in the indication of allowable subject matter.

The preambles of claims 1 and 2 have been amended to recite "a device for use with a syringe", as required by the Examiner. Further amendments have also been effected to these claims, some of which are based on the amendments proposed by the Examiner in the telephone interview on March 22, 2005, which together with the following comments on the cited Johnson and Shapiro et al. references are believed to address the obviousness-based objections raised in the Office Action.

The Examiner's position is that U.S. Patent No. 4,710,180 (Johnson) discloses a cannula having a single passageway with an open upper end, a lower end defining a blunt closed tip and a pair of side port holes that are diametrically opposed and slightly offset to each other near the vicinity of the cannula tip. Applicant respectfully disagrees. The Johnson device is a needle and syringe assembly designed to inject particles of fat into a patient's body, an application which is significantly distinct from that of the neural transplantation device defined in amended claim 1 and all dependent claims thereof. The Johnson device includes a needle with a distal part designed in a conical configuration to facilitate insertion of the needle into the patient's body. The needle of Johnson is further characterized as having several ports equally spaced radially around the circumference of the needle, and proximal to the conical endpoint thereof. The

Johnson needle is not designed to be used in neural applications, but rather is designed to inject large amounts of fat particles through the multiple ports.

In contrast, the neural transplantation device defined in amended claim 1 and claims 8, 9 and 11 to 14 is particularly designed to be atraumatic to the delicate brain tissue, and includes a cannula having a blunt closed tip, which is particularly important in reducing brain injury. Use of a conical needle tip as described by Johnson would increase the risk of the pointed needle tip tearing or puncturing the delicate blood vessels in the brain, causing a catastrophic intracerebral hemorrhage.

Applicant further disagrees with the Examiner's assertion that the ports (24) illustrated in Figure 4 of Johnson are "diametrically opposed and slightly offset". The ports (24) are described at column 2, lines 64 to 68 of the Johnson reference, as "a plurality of radial ports" ... "preferably three ports (24) which are equally spaced about the circumference of the needle intermediate portion (12)". The radial ports described by Johnson are not illustrated in Figure 4 as being diametrically opposed and offset, nor are they taught or implied to be so-positioned in the text of the patent. The delivery ports on the Johnson device are multiple and placed equidistantly around the circumference of the needle in order to facilitate the concentrated delivery of fat particles. This is in contrast to the "pair of side port holes" specified in amended claim 1, which are diametrically opposed and offset from each other to facilitate the delivery of the syringe contents "along a single trajectory in a three-dimensional spiral array at a predetermined neural injection site". In operation, the device of amended claim 1 delivers a deposit of cells in a three-dimensional spiral array as the cannula rotates and is withdrawn axially. The spiral arrangement of the cell deposits allows for enough brain tissue to surround each cell deposit and provide

access to oxygen and nutrients. The Johnson device cannot provide this spiral deposit arrangement along a single trajectory since the radial ports (24) are located at the same level, i.e., equally spaced about the circumference of the needle. Such an arrangement would create large clumps of cells with no brain tissue in between, and would impair oxygenation and nutrition.

As discussed above, the hand-held device disclosed by Johnson has been designed to deliver particles of fat obtained from cosmetic liposuction procedures, and not live cells into the brain, and thus one skilled in the art would not be able to combine the Johnson device with a liquid dispensing device, such as that described in U.S. Patent No. 4,415,101 (Shapiro et al.), to arrive at the neural transplantation device of amended claim 1.

Furthermore, the Shapiro et al. device is a hand-held liquid repetitive dispensing device for delivering a set volume of liquid by pressing a spring-loaded push button, and will deliver a liquid bolus when the push button is depressed. This bolus delivery would be detrimental to the cells as they would be pushed quickly through the portholes of the Johnson device or any other similar device. Such a bolus injection would force the cells against the brain parenchyma, further causing trauma to the brain and increasing the chance of brain hemorrhage. The microinjector defined inamended claim 1 facilitates the "incremental depression of the plunger (12) to result in a metered delivery of the contents of the syringe barrel". This incremental delivery decreases trauma to the cells as they slowly exit the side port holes of the cannula, and allows time for the surrounding brain parenchyma to accommodate for the deposits, thus increasing cell survival and decreasing brain trauma. Accordingly, the device of Shapiro et al. would not be combined by one skilled in the art with a syringe and needle such as that described by Johnson to address the problem met by the neural transplantation device of amended claim 1.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below.

No additional fee is required for this amendment. However, the Commissioner is hereby authorized to charge payment of any fees due with this communication or credit any overpayment to Deposit Account No. 19-0513.

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